

What is claimed is:

1. A client-server collaboration method for enabling packet transfer delay variation compensation in a multimedia streaming system, in which a signal indicative of pre-decoding buffering parameters is provided by a streaming server to a streaming client, and wherein the pre-decoding buffering parameters indicated by the server are chosen such as to ensure that the client is able to play out a packet stream without client buffer violation if the packet stream is transmitted over a constant delay, reliable channel, said method comprising:
 - determining client's chosen pre-decoding buffering parameters; and
 - providing information indicative of the client's chosen pre-decoding buffering parameters to the server, so that the client's jitter buffering capabilities can be determined based on a difference between the pre-decoding buffering parameters provided to the streaming server and the pre-decoding buffering parameters provided by the streaming server.
2. A method according to claim 1, wherein the pre-decoder buffer parameters provided by the server to the client are chosen based on the variable bit-rate characteristics of the transmitted packet stream and the buffering applied by the server.
3. A method according to claim 1, wherein the client provides the information indicative of the client's chosen buffering parameters to the server as soon as the client determines the pre-decoding buffering parameters chosen to be used for a particular streaming session.
4. A method according to claim 1, wherein the client provides the information indicative of the client's chosen buffering parameters to the server when starting a new streaming session.
5. A method according to any of claim 1, wherein the client is adapted to dynamically change its buffering parameters during a streaming session, said method further comprising providing further information indicative of the client's changed buffering parameters to the server during the streaming session.

6. A method according to claim 1, further comprising
applying in the streaming server rate-control and/or rate shaping algorithms that
utilize the information indicative of the client's chosen pre-decoding buffering parameters to
compensate for packet transfer delay and channel rate variations.

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7. A method according to claim 1, wherein the streaming server optionally considers the
information indicative of the client's chosen buffering parameters in rate control and/ or rate
shaping.

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8. A method according to claim 1, wherein the information indicative of the client's
chosen buffering parameters includes at least one of the following:
information regarding a size of the client's pre-decoder buffer,
information regarding a pre-decoder buffering period, and
information regarding a post-decoder buffering time.

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9. A method according to claim 1, wherein the streaming client provides the information
indicative of the client's chosen pre-decoding buffering parameters to the streaming server in
an RTSP OPTIONS request message.

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10. A method according to claim 1, wherein the streaming client provides the information
indicative of the client's chosen pre-decoding buffering parameters to the streaming server in
an RTSP PLAY request message.

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11. A method according to claim 1, wherein the streaming client provides the information
indicative of the client's chosen pre-decoding buffering parameters to the streaming server in
an RTSP PING request message.

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12. A method according to claim 1, further comprising
determining in the streaming client whether the streaming server supports the
signaling of client buffering parameters.

13. A streaming client device including at least one buffer, comprising:
means for receiving a packet stream from a streaming server and storing the packet
stream in the at least one buffer;
means for playing-out the packet stream; and
5 means for providing information indicative of the client's chosen buffering
parameters to the streaming server.

14. A streaming client device according to claim 13, wherein said at least one buffer
comprises a pre-decoder buffer and a delay jitter buffer.

15. A streaming client device according to claim 13, wherein said at least one buffer
comprises a pre-decoder buffer, a delay jitter buffer and a post-decoder buffer.

16. A streaming client device according to claim 14, wherein the pre-decoder buffer and
15 delay jitter buffer are integrated as a single unit.

17. A streaming client device according to claim 15, wherein the pre-decoder buffer and
the delay jitter buffer are integrated as a single unit.

20 18. A streaming client device according to claim 13, further comprising
means for receiving an indication of pre-decoder buffering parameters chosen by the
streaming server.

19. A streaming client device according to claim 13, wherein the client device provides
25 the information indicative of the client's chosen buffering parameters to the server as soon as
the client determines the buffering parameters chosen to be used for a particular streaming
session.

20. A streaming client device according to claim 13, wherein the client device provides
30 the information indicative of the client's chosen buffering parameters to the server when
starting a new streaming session.

21. A streaming client device according claim 13, wherein the client device is adapted to change its chosen buffering parameters dynamically during a streaming session, and wherein said providing means further providing information indicative of the client's changed
5 buffering parameters to the server during the streaming session.

22. A streaming client device according to claim 13, wherein the information indicative of the client's chosen buffering parameters includes at least one of the following:
information regarding a size of the client's pre-decoder buffer,
10 information regarding a pre-decoder buffering period, and
information regarding a post-decoder buffering time.

23. A streaming client device according to claim 13, wherein said providing means provides the information indicative of the client's chosen buffering parameters to the
15 streaming server in an RTSP OPTIONS request message.

24. A streaming client device according to claim 13, wherein said providing means provides the information indicative of the client's chosen buffering parameters to the streaming server in an RTSP PLAY request message.
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25. A streaming client device according claim 13, wherein said providing means provides the information indicative of the client's chosen buffering parameters to the streaming server in an RTSP PING request message.

25 26. A streaming client device according to claim 13, wherein the client device is adapted to determine whether the streaming server supports the signaling of client buffering parameters.

27. A streaming server device comprising:
30 means for transmitting a packet stream to a streaming client device, and

means for receiving information indicative of chosen buffering parameters of the streaming client device.

28. A streaming server device according to claim 27, adapted to provide a signal indicative of pre-decoding buffering parameters to the streaming client, wherein said pre-decoding buffering parameters indicated by the server are chosen such as to ensure that the client device is able to play out the packet stream without client buffer violation if the packet stream is transmitted over a constant delay, reliable channel.

29. A streaming server device according to claim 27, adapted to apply rate-control and/or rate shaping algorithms that utilize the information indicative of the client's chosen buffering parameters to compensate for packet transfer delay and channel rate variations occurring during transmission of said packet stream from the streaming server device to the streaming client device.

30. A streaming server device according to claim 27, adapted to optionally consider the information indicative of the client's chosen buffering parameters in rate control and/or rate shaping.

31. A streaming server device according to claim 27, wherein the information indicative of the client's buffering parameters received by the server includes at least one of the following:

information regarding a size of the client's pre-decoder buffer,
information regarding a pre-decoder buffering period, and
information regarding a post-decoder buffering time.

32. A data streaming system comprising:

a streaming client device, and

a streaming server device, wherein the streaming client device comprises:

means for playing-out a packet stream provided by the streaming server device; and

means for providing information indicative of the client's chosen buffering parameters to the streaming server device, and wherein the streaming server device comprises

means for transmitting the packet stream to the streaming client device, and

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means for receiving the information indicative of the client's chosen buffering parameters.